SCOPE OF SERVICES

Solicitation Number: CLMP130
Project Name: South Austin Regional WWTP Blower Improvement Project

PROJECT FOR:

City Of Austin, Austin Water Utility, through its Contract Management Department

PROJECT TITLE:

South Austin Regional Wastewater Treatment Plant Blower Improvement Project

OBJECTIVES OF THE PROJECT:

The City of Austin (City) anticipates selecting an engineering firm (Consultant) to provide blower capacity assessment and recommendations of use for Treatment Train A and Treatment Train B.

BACKGROUND:

The South Austin Regional Wastewater Treatment Plant (SARWWTP) has three Treatment Trains: Train A, Train B, and Train C. Treatment Train A construction originally started in 1984 and was completed in April 1986. Immediately after that project, Treatment Train B was constructed and completed in late 1988. Construction of Train C was completed in 2005 Treatment Trains A and B were designed for 20 millions of gallons per day (MGD) each for a total design capacity of 40 MGD. Train C has a total design capcity of 25 MGD.

For the Treatment Train A project, three single stage Atlas Copco blowers (nos. 1,2, and 3) were installed; each rated at 20,000 standard cubic feet per minute (SCFM) with 1850 HorsePower (HP) motors. Coarse bubble diffusers were installed in the Treatment Train A aeration basins. During the Treatment Train B project, two more blowers (nos. 4 & 5) were installed, which were Cord Turbo single stage blowers and were also rated at 20,000 SCFM with 1250 HP motors. During the Treatment Train B construction, fine pore diffusers were installed in the Train B aeration basins. In an effort to maximize oxygen transfer in Train A, coarse bubble diffusers were replaced with fine pore diffusers as part of the Train B construction project.

In the early 1990's, SARWWTP was successful in getting each Treatment Train capacity rerated to 25 MGD, for a total plant capacity of 50 MGD, without the construction of additional treatment units. The rerating was based on plant performance and no further modifications were made to the blowers or the air distribution system. In 2005, Cord Turbo blower no. 5 experienced a severe electrical problem, caught fire, was destroyed and never replaced.

In August of 2011, SARWWTP experienced a major chlorine leak which effectively eliminated the use of the blowers for Trains A and B for a short duration. The chlorine leak damaged all the blower controls, instrumentation, condition monitoring devices, the building where the blowers were housed, including the motor control center for blowers and other electrical equipment that was in the same building, such as air conditioning, lighting, and ventilation fans. Two used multi-stage temporary blowers (nos. 6 and 7), provided by HSI, were brought onsite and set up. The HSI blowers have an operating range of 12,000 to 19,000 SCFM with 1250 HP motors.

Currently blowers nos. 2 (Atlas Copco), 4 (Cord Turbo), 6 (HSI), and 7(HSI) are available for use; however, all the blowers are problematic and unreliable. A condition assessment of the secondary treatment building has recently been completed with preliminary results showing all blowers (existing and temporary) have a remaining useful life of 1 to 5 years.

Train C blowers were not impacted by the chlorine leak and are in reasonably good condition.

ANTICIPATED SERVICES:

The following is a general list and is not inclusive of all anticipated services and phases of work to be provided are:

Phase I: Preliminary Engineering and Environmental Consideration Investigations Report

The selected Consultant will review data of existing facilities and conduct condition assessment of existing blowers. Based on the assessment, consultant will be required to develop several recommendations which may include total replacement, partial rehabilitation and potential phasing options among others. The Consultant will develop a business case for each recommendation (life cycle cost evaluation, financial evaluation (NPV, payback and IRR). The Consultant will provide an evaluation of non-economic factors (operational flexibility, ease of operations, sustainability, etc.). Along with the number and type of blowers, the Consultant will identify and evaluate load and demand management options to support plant optimization and energy conservation opportunities.

Modeling efforts should be considered by the Consultant to identify the existing and potential problems arising from installation of the proposed blowers and to evaluate proposed solutions. The selected firm must have experience in accessing plant air system needs, modeling, design, instrumentation automation, and the construction activities associated with installation of new blowers; developing a schedule for implementation of the improvements; and estimation of construction costs.

Services necessary to accomplish Phase I may include:

1. Conduct preliminary field surveys and determine any site constraints and special permitting requirements (Federal, State, and Local).

2. Evaluate air needs for Treatment Trains A and B. Consideration must be given to upcoming future process modifications, such as conversion of the plant to a biological nutrient removal (BNR) facility. Other potential air needs must be considered, such as in the existing Trains A and B equalization basins, aerated grit chambers, sludge transfer tank, and other air needs that may be needed or recommended. Select the type and number of blowers required to provide the required air needs.
3. Determine the usability/adequacy of the existing building structure where blowers and the motor control center are located. Design modifications, upgrades or other items needed to provide an adequate enclosure for the blowers. The rehabilitated building enclosure for the blowers is to be equipped with noise attenuation features.
4. Determine the need and type of air filtration required by blowers.
5. Develop recommendations, design, and program the blower controls, blower protections, condition monitoring instrumentation, blow-off system, and linkages to the SCADA system that are compatible with the number and type of blowers to be provided.
6. A new motor control center will be required for the blowers and other electrical equipment (HVAC, lighting, etc) currently housed in the secondary treatment building. The electrical power supply will be equipped with lightning arresters, voltage surge protection, and UPS device(s) to maintain control power. Provisions will be included that allow for the connection of a generator such that at least two blowers can be used in case of a major prolonged power outage.
7. Develop and design an air header/piping system that will allow maximum flexibility to use any blower to provide air to either Train A and/or B with adequate valve placement for effective blower isolation and air distribution. Tie new air header system into existing plant air distribution system. The Consultant shall recommend and perform testing protocol for field assessment of yard main air supply lines necessary for eliminating air leaks.
8. Evaluate the programming of the Train C blowers to minimize surge events due to dynamic changes in system pressure.
9. Upon conclusion of all reviews, investigations, analyses and preliminary evaluations: prepare, present and publish details and summarization of all findings, solution options, cost estimates, alternate routes, recommendations, and a design and construction schedule into a **Comprehensive Preliminary Engineering Report**.

Phase II: Design and Bid Documents Preparation

After completion of Phase I, the Consultant shall, upon specific written authorization:

1. Conduct or otherwise acquire the necessary field surveys, soils, and peripheral investigations for final design of this blower system.
2. Prepare final detailed plans, specifications (utilizing City standards), contract documents and cost estimates for the construction of project improvements as approved by the City.

3. Furnish sub-consultant services, as may be appropriate, for the execution of the design.
4. Assist in applying for and obtaining regulatory agency approvals and permits necessary for the construction of the project.
5. Provide property descriptions necessary for the City's easement right-of-way acquisition actions.
6. Assist in advertising the project for bids and developing construction contract(s).

Phase III: Construction Management Services

The construction professional services which may be required are:

1. Periodic visits to the job site, by the design professionals, to generally review the progress and character of the work performed.
2. Review of periodic payment estimates of the contractors completed work.
3. Review and approve shop drawings and any necessary change orders, interpretation of the plans, specifications, and other contract documents as required.
4. Conduct project reviews with the City and contractors.
5. Prepare as-built drawings of the completed facilities (ink on mylar or photographically reproduced mylar tracings) including computer disc copies in AutoCAD format, as well as any other necessary services associated with the engineer's design as applied to the construction processes.
6. Warranty phase services may need to be provided and the scope details for required services will be determined at a later date.

PROPOSED SCHEDULE:

Preliminary Engineering Phase	6 Months
Design Phase	12 Months
Bid and Award Phase	6 Months
Construction/Warranty Phase	36 Months

COST ESTIMATE:

The estimated total cost for professional services is $2,500,000 and the estimated total construction cost is $12,000,000. The professional services estimated cost by phase is as follows:

Preliminary Engineering Phase	$ 500,000.00
Design Phase	$1,600,000.00
Bid and Award Phase	$100,000.00
Construction/Warranty Phase	$300,000.00

POTENTIAL SUBCONSULTANT/VENDOR OPPORTUNITIES:

Below is a list of *potential* subconsultant opportunities on this project. This listing is not a guarantee that each of the scopes listed below will materialize on this contract. If the prime consultant intends to enter into a subconsulting agreement on a scope of work not listed below, the prime consultant is required to contact SMBR and request an updated availability list of certified firms in each of the scopes of work for which the prime consultant intends to utilize a subconsultant

Major Scopes of Work*
Civil Engineering
Environmental Services
Electrical Engineering
Structural engineering

Other Scopes of Work
Geotechnical Engineering
Surveying services

*There must be representation for all major scopes of work listed. The experience of the firms listed to perform the Major Scopes of Work, whether a subconsultant or prime firm, will be evaluated under Consideration Item 6 – Major Scopes of Work – Comparable Project Experience.

Notes:

- Participation at the prime or subconsultant level may create a conflict of interest and thus necessitate exclusion from any contracts resulting from the work performed in the design phase.

- If the City determines that a conflict of interest exists at the prime or subconsultant level, the City reserves the right to replace/remove the prime or instruct the prime consultant to remove the subconsultant with the conflict of interest and to instruct the prime consultant to seek a post-award change to the prime consultant's compliance plan as described in City Code § 2-9B-23. Such substitutions will be dealt with on a case-by-case basis and will be considered for approval by Small and Minority Business Resources (SMBR) in the usual course of business. The City's decision to remove a prime or subconsultant because of a conflict of interest shall be final.

- Construction Inspection and Public Information and Communications are **NOT** a subconsultant opportunity on this rotation list. These services will be preformed in-house or under a separate contract, if needed, and will be determined when project assignment is made.